

**PSEPHENOPALPUS BROWNI, A NEW GENUS AND SPECIES OF
PSEPHENINAE (COLEOPTERA: BYRRHOIDEA: PSEPHENIDAE)
FROM MEXICO**

ROBERTO ARCE-PÉREZ

Instituto de Ecología, A.C. Km. 2.5 Antigua Carretera a Coatepec 351, Congregación el Haya, Apartado Postal 63, 91070 Xalapa, Veracruz, México (e-mail: arcerob@ecologia.edu.mx)

Abstract.—*Psephenopalpus browni*, n. gen., n. sp. is described and illustrated from specimens collected in a stream running through a cloud forest in the Mexican town of Coatepec, Veracruz (1200 m). *Psephenopalpus browni* can be distinguished from other Psepheninae by the body shape, antennal length, and the size proportions of the phallobase and parameres (from *Pheneps*) and by the pronotum, maxillary palpi, and tarsi (from *Psephenotarsis*, *Psephenops*, *Psephenus*). *Psephenopalpus* appears to be more closely related to *Psephenops* than to other Psepheninae. A key for American Psepheninae genera is provided.

Resumen.—Se describe e ilustra a *Psephenopalpus browni*, n. gen. y n. sp. con base en especímenes colectados en un arroyo de agua dulce que atraviesa un bosque nebuloso en Coatepec (1200 m snm), estado de Veracruz, México. *Psephenopalpus browni* se puede diferenciar de otros Psepheninae por la forma del cuerpo, la longitud de las antenas, la proporción entre la falobase y los parámetros (*Pheneps*); también por la forma del pronoto, longitud y forma de los palpos maxilares y la región tarsal (*Psephenotarsis*, *Psephenops*, *Psephenus*). Al parecer *Psephenopalpus* está más cercanamente relacionado a *Psephenops* que al resto de los Psepheninae. Se proporciona una clave para la identificación de los géneros Americanos de Psepheninae.

Key Words: Psephenidae, Psepheninae, new genus, description, key, State of Veracruz, Mexico

The subfamily Psepheninae is represented in the New World by the genera *Psephenus* Haldeman 1853, *Psephenops* Grouvelle 1898, *Pheneps* Darlington 1936, and *Psephenotarsis* Arce-Pérez 2001 (Brown 1981, Spangler 1982, Arce-Pérez and Novelo-Gutiérrez 2001, Arce-Pérez and Shepard 2001). *Psephenus* contains 15 species with seven in North America, two of which are also found in Mexico; four in Mesoamerica; three in Brazil; and one in Peru. *Psephenops* has eight species (Arce-Pérez

and Novelo-Gutiérrez 2000, Bameul 2001, Arce-Pérez 2002) with a tropical distribution, including two in Mexico, one in Guatemala, one in Costa Rica, one in Haiti, one in the Antilles with one subspecies, one in Colombia that is also found in Costa Rica, and one in Argentina. *Pheneps* has eight species (Arce-Pérez and Novelo-Gutiérrez 2001, Souza Fernandez et al. 2001) also tropical, with one in Cuba, one in Haiti, one in Surinam, one in Venezuela also found in Brazil, and another four in Brazil. *Psephe-*

notarsis includes one species in Mexico. In this paper, a new genus and new species are reported for Mexico.

Twenty-six male specimens were collected from a stream running through a cloud forest located in the Mexican town of Coatepec, Veracruz (alt. 1,200 m), municipality of Coatepec. Individuals were initially preserved in 80% ethanol and some were pinned later. All collected material was examined. Male genitalia were extracted in ethanol, and potassium hydroxide (KOH 5%) was used to clear genitalia to make illustrations. Microphotographs were taken with a JEOL scanning electron microscope, model JSM T20 with 200× magnification.

***Psephenopalpus* Arce-Pérez, new genus**
(Figs. 1, 5, 7, 12–14)

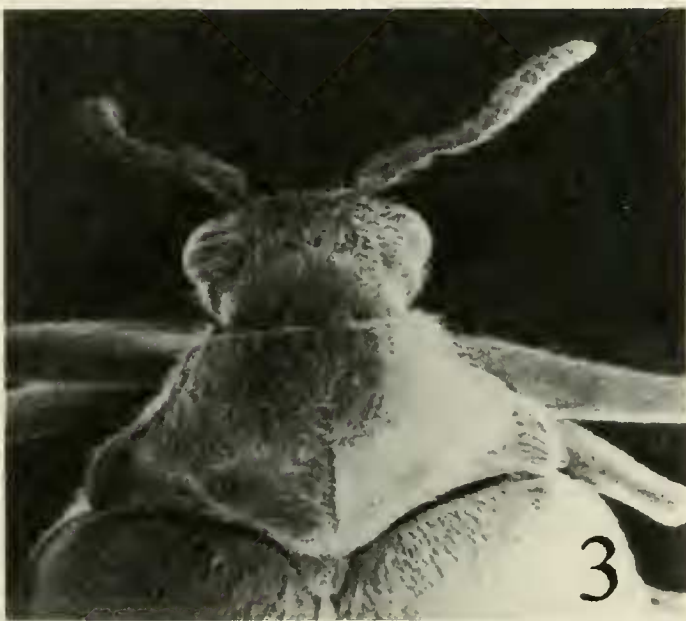
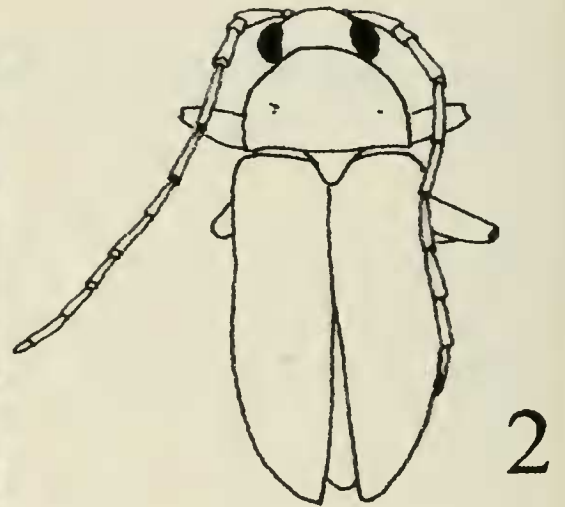
Description.—Head (Fig. 1) short, transverse; eyes spherical, very prominent. Antenna long, filiform-subserate, 11-segmented, extending beyond elytral humerus; scape and pedicel yellowish, 9 flagellar segments dark reddish brown. Maxillary palpus (Fig. 5) extremely long, extending beyond sixth antennal segment, second palpomere much longer than the other palpomeres. Pronotum (Fig. 1) subtrapezoidal, its posterior margin quite smooth, never crenulate or rugose; lateral margins rounded, unexpanded at posterior middle, disc with feeble middorsal longitudinal carina; prosternum (Fig. 5) short, slightly elevated at middle, prosternal process long with sides parallel at middle, then gradually diverging to form a lanceolate apex; mesosternum clearly grooved and slightly bifurcate apically, so procoxa and mesocoxa not far apart. Tarsi 5-segmented (Fig. 7), first four tarsomeres short, subtriangular and covered with long setae, ventral vestiture spongy, fifth tarsomere much longer than first four together, cylindrical, slender, smooth; tarsal claws long, whole, curved, lacking denticle and accessory membranes.

Male genitalia (Figs. 12, 13, 14): In dorsal view (Fig. 12) subrectangular, trilobate; phallobase shorter than parameres; para-

meres shorter than median lobe, with external apical margin sinuate to 0.40, ending in a rounded apex, lateroapical portion membranous; (Fig. 13) middle lobe sclerotized, fingerlike in ventral view, (Fig. 14) dorsally convex, with sharp apex and curved in lateral view.

Remarks.—*Psephenopalpus* can be distinguished from other Psepheninae genera by the following characteristics: In *Pheneps* the body is more slender; the maxillary palpus is short; the antennae are long reaching 0.75 the length of elytra; the pronotum and elytra lack expanded margins (Fig. 2); tarsomeres 1–2 are clearly stouter than any of the three apical tarsomeres (Fig. 8); and the phallobase is notably larger than the parameres. In *Psephenops*, the second maxillary palpomere is proportionally much shorter (Fig. 6); the pronotum is expanding laterally on the posterior half (Fig. 3); and tarsomeres 1 and 2, and occasionally 3, have wide ventral expansions that cover the apical tarsomeres (Fig. 9). In *Psephenotarsis*, the maxillary palpus is short; the antennae are short and moniliform; the pronotum is expanded laterally in the posterior half (Fig. 4); and the tarsomeres are notably triangular, flattened and widely emarginate (Fig. 10). In *Psephenus*, the maxillary palpus is short; the basal half of the pronotum is occasionally expanded; the four basal tarsomeres are slender and subcylindrical and slightly emarginate in their apices, with delicate, minute setae or papillae ventrally (Fig. 11); and the median lobe of the male genitalia is mostly membranous and shorter than or as long as the parameres.

Psephenopalpus appears to be more closely related to *Psephenops* than other Psepheninae, mainly by the pronotal carina; filiform subserrate antennae; posterior margins of sternites 1 and 2 slightly sinuate or emarginate; the basal tarsomeres with spongy ventral vestiture; and in general appearance. The two may be distinguished by the following combination of characters (those of *Psephenops* in parentheses): Pronotum with lateral margins rounded and



Figs. 1–6. 1, *Psephenopalpus browni*, adult male, dorsal aspect of head and pronotum. 2, *Pheneps cursitatus* Spangler, adult male, dorsal aspect. 3, *Psephenops mexicanus* Arce-Pérez and Novelo-Gutiérrez, adult male, dorsal aspect of head and pronotum. 4, *Psephenotarsis triangularis* Arce-Pérez and Novelo-Gutiérrez, adult male, dorsal aspect. 5, *Psephenopalpus browni*, adult male, ventral aspect of head. 6, *Psephenops lupita* Arce-Pérez, adult male, ventral aspect of head and prosteronum. (Fig. 2 from Spangler 1987; Fig. 3 from Arce-Pérez and Novelo-Gutiérrez 2000; Fig. 4 from Arce-Pérez and Novelo-Gutiérrez 2001; Fig. 6 from Arce-Pérez 2002.)

unexpanded (expanded laterally on posterior half); maxillary palpus extremely long, with the second palpomere much longer than the other palpomeres (maxillary palpus short, last palpomere larger); the basal tarsomeres with short ventral expansions (tarsomeres 1 and 2, and occasionally 3, with wide ventral expansions that cover the apical tarsomeres); and fifth tarsomere much longer than the first four together, cylindrical, slender and smooth (second tarsomere lobed ventrally, much longer than the other tarsomeres).

Etymology.—From the Greek “*Psepheno*” (hidden) and “palpus” (palpomeres), referring to the palpomere characteristic that distinguishes this genus from other Psepheninae.

***Psephenopalpus browni* Arce-Pérez,
new species**

(Figs. 1, 5, 7, 12, 13, 14)

Description.—*Holotype male*: Body oval tapered, depressed; integument reddish black, completely covered with dense vestiture of short and long reddish yellow setae with golden highlights; venter with short yellowish gray setae with golden highlights. Head, pronotum, and scutellum black; antenna and elytron dark reddish brown, elytron without striae, with light yellow mark in mid basal region; legs with yellow coxae, trochanters, and femora; tibiae and tarsi dark reddish; total length 3.85 mm, maximum humeral width 1.70 mm.

Head (Fig. 1): Black, short, transverse, covered with short vestiture, yellowish setae and long dark reddish setae; eyes spherical, very prominent; clypeus subrectangular, wider than its length, declivous at an angle of less than 90° from plane of frons, distal margin widely emarginate; labrum like clypeus but shorter; antenna long, filiform subserrate, 11-segmented, extending past elytral humerus, scape and pedicel yellowish, 9 flagellar segments dark reddish; scape larger than all other segments, slightly curved, pedicel half as long as scape; flagellum with 9 slim, subserrate segments

covered with long reddish-black setae; maxillary palpus 4-segmented (Fig. 5), slightly longer than first six antennomeres combined, three basal palpomeres subcylindrical, apical palpomere ovoid; first maxillary palpomere shortest, second 7.75 times longer than first and slightly sinuate, third palpomere slightly larger than second at middle; fourth slightly longer than third but ovoid and depressed with rounded apex and large sensorial region; relative proportion of segments: 0.07, 0.54, 0.31, 0.34; all palpomeres dark reddish and covered with reddish setae; labial palpus very short (Fig. 5), 3-segmented, not extending beyond basal margin of first maxillary palpomere, two basal labial palpomeres rounded and wide, segment 3 subspherical and shorter; all palpomeres dark reddish and covered with reddish setae.

Thorax: Pronotum (Fig. 1) black and subtrapezoidal (posterior margin 1.55 mm, lateral margin 0.83 mm); anterior margin arcuate, posterior margin bisinuate and almost as wide as elytral base; lateral margins rounded and unexpanded; posterolateral angles subacute; pronotal disc with mid-dorsal longitudinal carina weakly developed near base, slight depression at each side of carina; in profile, pronotal disc convex; prosternum (Fig. 5) short and slightly elevated; long, concave, and lanceolate prosternal process reaching anterior half of mesosternum. Mesonotum with scutellum short and black, with tip broadly rounded; elytron dark reddish brown with light-colored stain in mid-basal region, lacking striae, with short yellow setae and long reddish-yellow setae, sides parallel on basal 0.75, then gradually converging posteriorly and margins expanding slightly; length from base to apex of suture 2.80 mm, width 1.70 mm across humerus. Mesosternum reddish black with wide groove for reception of prosternal process and slightly bifurcate at apex. Metasternum reddish black, large and voluminous, with longitudinal canal, deeper apically and ending in front of metacoxae.

Legs (Fig. 7): Coxae, trochanters, and

femora yellow; tibiae and tarsi dark reddish, almost black; procoxa globose, mesocoxa conical, metacoxa transverse; femora robust with dark reddish yellow setae, tibiae slender, protibia with distinct apical posterolateral denticle, metatibia longer than femur; tarsi 5-segmented, the first four tarsomeres short and subtriangular with slight ventral expansions and covered with long setae, ventrally with spongy vestiture; first tarsomere covering half of second, vestiture of second tarsomere covering all or almost all of third, fourth tarsomere small and free or with sparse setae; fifth tarsomere much longer than all others combined (0.32 mm compared to 0.44 mm), subcylindrical and smooth, tarsomere proportions 0.14, 0.20, 0.10, 0.10, 0.44 mm; claws long, curved, without denticles or accessory membranes.

Abdomen: Ventrally convex, with seven sternites; first sternite slightly lifted in mid-basal region, second and third sternites flat in middle; posterior margin of sternites 1 and 2 slightly sinuate in middle; sixth sternite short, widely emarginate and hidden under fifth sternite; seventh sternite much smaller and oval in shape; pygidial plate oval, convex, with long, dark reddish setae.

Genitalia (Figs. 12, 13, 14): Trilobate, total length 0.66 mm. Parameres in dorsal view (Fig. 12) voluminous, shorter than middle lobe, with external margin sinuated at apical 0.40, ending in a rounded apex with lateroapical membrane, length 0.36 mm; penis in ventral view (Fig. 13) longer than parameres, fingerlike, widening at basal half, length 0.40 mm, with robust longitudinal sclerite sublanceolate in shape, in lateral view (Fig. 14) dorsally convex, with curved sharp apex; dorsal area of phallobase concave (Fig. 12); ventrally voluminous, subcylindrical; length 0.26 mm.

Female: Unknown (females of this species may be larger and bulkier than males but less frequently collected).

Variation in paratype series.—Some specimens have dark coxae, other specimens have a yellowish ventral region, mainly on the metasternum. Measurements

(in mm): total body length 3.10–4; maximum width 1.45–1.77; pronotal length 0.75–0.90, basal width 1.25–1.55; elytral length 2.67–2.95.

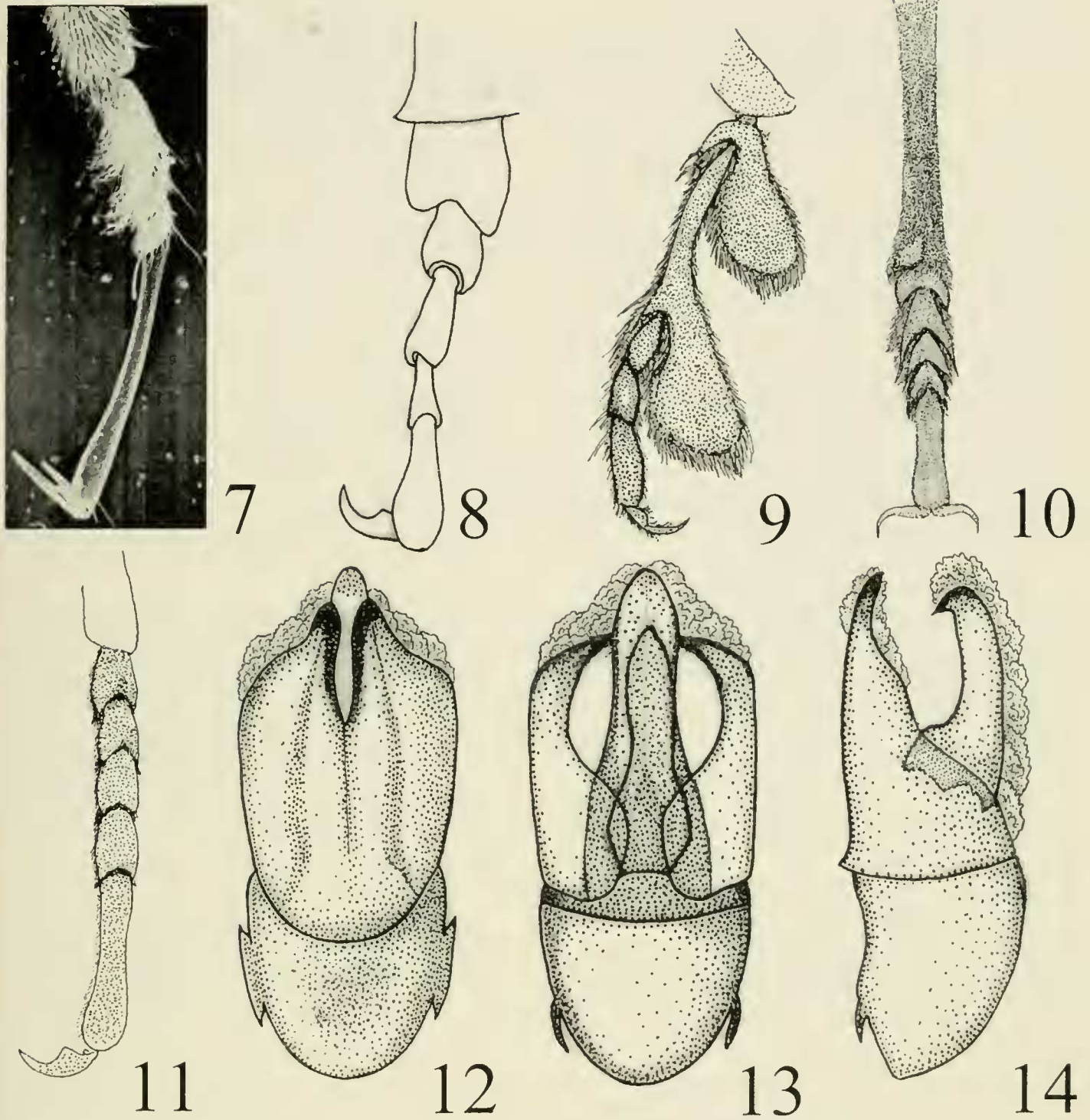
Type material.—Holotype ♂ labeled: "MEXICO, Veracruz, Municipality Coatepec, Coatepec, Huehueyapan River, 1,200 m, mountainous cloud forest, 1-V-2000, Roberto Arce col." 7 ♂ paratypes, same data as holotype; 18 ♂ paratypes, same as holotype except for, four 6-V-2000; five 19-IV-2000; one 29-III-2001, and eight 17-III-2002. Holotype and paratypes deposited at Colección Entomológica, Instituto de Ecología, A. C., Xalapa, Veracruz, México (IEXA).

Etymology.—It is with pleasure that I dedicate this species to Professor Harley P. Brown of the University of Oklahoma because of his contributions to research and knowledge of American Psepheninae.

Habitat.—Adult males were captured in a quick-flowing stream, on stones covered with moss and aquatic phanerogams, and near *Psephenops lupita* Arce-Pérez individuals.

KEY TO NEW WORLD GENERA OF
PSEPHENINAE BASED ON ADULTS
[Modified from Brown (1976) and White
and Brigham (1996)]

1. Antenna long, filiform, extending notably beyond elytral humeri (Fig. 2); pro- and mesotarsomeres 1 and 2 markedly stouter than following three and slightly emarginate at apex (Fig. 8) *Pheneps*
- Antenna short, moniliform or subserrate, scarcely or not extending beyond elytral humeri; pro- and mesotarsomeres 1 and 2 of variable length but never stouter than following three tarsomeres 2
- 2(1') Pronotum with a mid dorsal longitudinal carina (Fig. 3) 3
- Pronotum without carina 4
- 3(2) Pronotum expanded laterally on posterior half, with a well-developed carina (Fig. 3); maxillary palpus short, last palpomere longest (Fig. 6); tarsomeres 1 and 2, and occasionally 3, with wide ventral expansions that cover apical tarsomeres (Fig. 9)
. *Psephenops*
- Pronotum with lateral margins rounded, not



Figs. 7–14. 7, *Psephenopalpus browni*, adult male, tarsus showing extreme length of fifth tarsomere. 8, *Pheneps antennalis* Spangler and Steiner, adult male, protarsal segments. 9, *Psephenops mexicanus*, adult male, showing tarsomeres with wide expansions. 10, *Psephenotarsis triangularis*, adult male showing emarginate tarsomeres 1–4. 11, *Psephenus* sp., adult male, tarsus showing relatively slender tarsomeres 1–4. 12, *Psephenopalpus browni*, male genitalia, dorsal aspect. 13, *Psephenopalpus browni*, male genitalia, ventral aspect. 14, *Psephenopalpus browni*, male genitalia, lateral aspect. (Fig. 8 from Spangler and Steiner 1983; Figs. 9–11 from Arce-Pérez and Novelo-Gutiérrez 2001.)

expanded on posterior half, with a feeble carina (Fig. 1); maxillary palpus extremely long, second palpomere much longer than other palpomeres (Fig. 5); tarsomeres without wide ventral expansions, fifth tarsomere much longer than first four together (Fig. 7) *Psephenopalpus*, gen. n.
 4(2') Tarsomeres 1–4 short, triangular, flattened.

deeply emarginate for reception of following tarsomere; tarsomeres 1–2 with long ventral setae or papillae, those on 2 reaching base of fifth tarsomere (Fig. 10)
 *Psephenotarsis*
 – Tarsomeres 1–4 subconical and slender, scarcely emarginate at apex; tarsomeres 1–2 usually with ventral setae or papillae that

never cover contiguous tarsomere (Fig. 11)
 *Psephenus*

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